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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,502	01/30/2002	Srinath Hosur	TI-33080	8465

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EXAMINER

JUNG, MIN

ART UNIT	PAPER NUMBER
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2616

DATE MAILED: 07/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/060,502

Applicant(s)

HOSUR ET AL.

Examiner

Min Jung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 19-35 is/are rejected.
- 7) ☒ Claim(s) 15-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 6, 9-11, 13, 14, 20-23, 26-28, 30, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al., US 6,172,993 (Kim).

Kim discloses a frame synchronization method and apparatus for use in digital communication system utilizing OFDM method.

Regarding claim 1 of the present invention, Kim teaches a wireless transmitter (Kim teaches operation on the transmission side, col. 1, lines 28-57, and col. 3, lines 46-58), comprising: circuitry for providing a plurality of control bits (transmission parameter signaling, TPS); circuitry for providing a plurality of user bits (user bits are shown in Fig. 2, the non-TPS bits); circuitry for modulating the plurality of control bits and the plurality of user bits into a stream of complex symbols (col. 1, lines 28-29); circuitry for converting the stream of complex symbols into a parallel plurality of complex symbol streams (col. 1, lines 29-31); circuitry for performing an inverse fast Fourier transform on the parallel plurality of complex symbol streams to form a parallel plurality of OFDM symbols (col. 1, lines 31-34); circuitry for converting the parallel plurality of OFDM symbols into a serial stream of OFDM symbols (inherent, also see col. 1, lines 34-38);

wherein each OFDM symbol in the serial stream of OFDM symbols comprises a plurality of data points (shown in Fig. 2); wherein selected OFDM symbols in the serial stream of OFDM symbols carry modulation information (TPS pilot shown in Fig. 2, see col. 3, lines 48-53); wherein the modulation information in one or more of the selected OFDM symbols comprises a plurality of modulation groups (There are 17 TPS pilots in 2K mode, see col. 3, lines 53-58); wherein each of the plurality of modulation groups comprises a number of modulation parameters that describe modulation of a corresponding set of data points in a subsequent OFDM symbol in the serial stream of OFDM symbols (a modulation information defined by alpha value of a QAM constellation pattern, a hierarchy information, a guard interval information, an inner code rate information, a frame number information, etc.).

Regarding claim 2, Kim teaches phase shift keying (col. 1, line 56 and col. 4, line 44).

Regarding claim 6, Kim teaches that the modulation parameters comprise an identifier of a superframe; that the superframe includes the selected OFDM symbol that includes the identifier; and that the superframe comprises an integer $N+1$ OFDM symbols. See col. 3, lines 49-53. Note that 'an integer $N+1$ ' is just an arbitrary integer number since N is not defined otherwise.

Regarding claim 20, the recited receiver features are inherent in an OFDM receiver. Although Kim does not specifically teach a receiver including antenna, a circuitry for recovering modulation information, etc., Kim teaches OFDM transmitting and receiving method which encompasses the well-known transmitter and receiver

features. See the background of the invention at cols. 1 and 2. Kim specifically teaches that the modulation in one or more of the selected OFDM symbols comprises a plurality of modulation groups, and that each of the plurality of modulation groups comprises a number of modulation parameters that describe modulation of a corresponding set of data points in a subsequent OFDM symbol in the serial stream of OFDM symbols. See Fig. 2, and col. 3, lines 48-58.

Regarding claims 21-23, Kim's teaching at col. 1, lines 28-38 describe the common steps performed in OFDM at a transmitting end. The corresponding steps as recited in claims 21-23 performed at a receiving end is inherent in Kim's teaching.

Regarding claims 9 and 26, Kim teaches that the modulation parameters comprise an identifier of a modulation type used for the corresponding set of data points. See col. 3, lines 49-53.

Regarding claims 10 and 27, Kim teaches coding rate indication. See col. 3, lines 49-53.

Regarding claims 11, 13, 28, and 30, Kim teaches redundancy bits for error protection. See col. 4, lines 21-22.

Regarding claims 14 and 31, Kim teaches coding type indication - 2K mode and 8K mode. See col. 3, lines 53-58.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-5, 7, 8, 12, 19, 24, 25, 29, 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim.

Regarding claims 3-5, 19, and 32-35, Kim fails to specifically teach that the number of symbols is a multiple of three, the selected OFDM symbols are each a third OFDM symbol in a sequence of three OFDM symbols, the modulation information is repeated, and the modulation parameters comprise an identifier of a number of data points in the set of data points. Kim teaches the frame structure of the OFDM signal as shown in Fig. 2. It is shown that the TPS pilot, which corresponds to the selected OFDM symbol of the present invention, is placed in a designated places as specified in Table 2. Although it is not placed as a third symbol in a sequence of three, it is taught that the TPS pilot is interleaved with data symbols. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to design the frame structure to place the selected OFDM symbol as every third symbol in the frame to accommodate different needs of the communication system.

Regarding claims 7, 8, 24, and 25, Kim fails to specifically teach that the modulation parameters comprise an identifier of the subsequent OFDM symbol, and that the modulation parameters comprise an identifier of a version of the broadband wireless internet forum. However, Kim teaches that the modulation parameters comprise a modulation information defined by alpha value of a QAM constellation pattern, a hierarchy information, a guard interval information, an inner code rate

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information, a frame number information, etc. With such teaching, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify the information included in the pilot signal to include different identifiers as the ones recited in claims 7, 8, 24 and 25.

Regarding claims 12 and 29, Kim fails to specifically teach an interleaver wherein the modulation parameter comprise an identifier of the interleaver depth used for the corresponding set of data points. Interleaving is an inherent function in an OFDM technique, and including an identifier of the interleaver depth would have been an obvious implementation for one of ordinary skill in the art at the time of the invention because of the same reason applied above for claims 7, 8, 24, and 25.

Allowable Subject Matter

5. Claims 15-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Hadad PG Pub., the Coulson et al. PG Pub., the Heinonen et al. patent, and the Kleider et al. patent are cited for further references.


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Min Jung whose telephone number is 571-272-3127.

The examiner can normally be reached on Monday through Friday 9:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJ
July 18, 2006


Min Jung
Primary Examiner